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August 2013

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**WILD SPRING
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STUDY**
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PINKS**
52

**BOBBER
FISHING FOR
KINGS**
78

**BEAD-
BLASTING
CHROME**
30



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36

FEATURES

BEAD-BLASTING CHROME _____ 30

Gary Lewis • *Bead systems that work*

CLACKACRAFT DRIFT BOAT WINNER! _____ 36

Russell Bassett • *Northwest Steelheaders*

BOXES IN THE BOAT _____ 40

Scott Haugen • *Diversified approach*

KING OF COLUMBIA KING FISHING _____ 46

Mark Gavin • *Chinook techniques*

PUGET SOUND PINKS _____ 52

Jason Brooks • *Fast and fun action*

STEELHEAD IN THE DARK _____ 58

Rick Itami • *Exciting and productive*

WILD SPRING CHINOOK _____ 64

Matthew Nesbit • *Where are they going?*

BUOY 10 _____ 68

Larry Ellis • *A day with Buzz Ramsey*

BOBBER FISHING FOR KINGS _____ 78

Scott Amerman • *Advanced techniques*



46



52



64

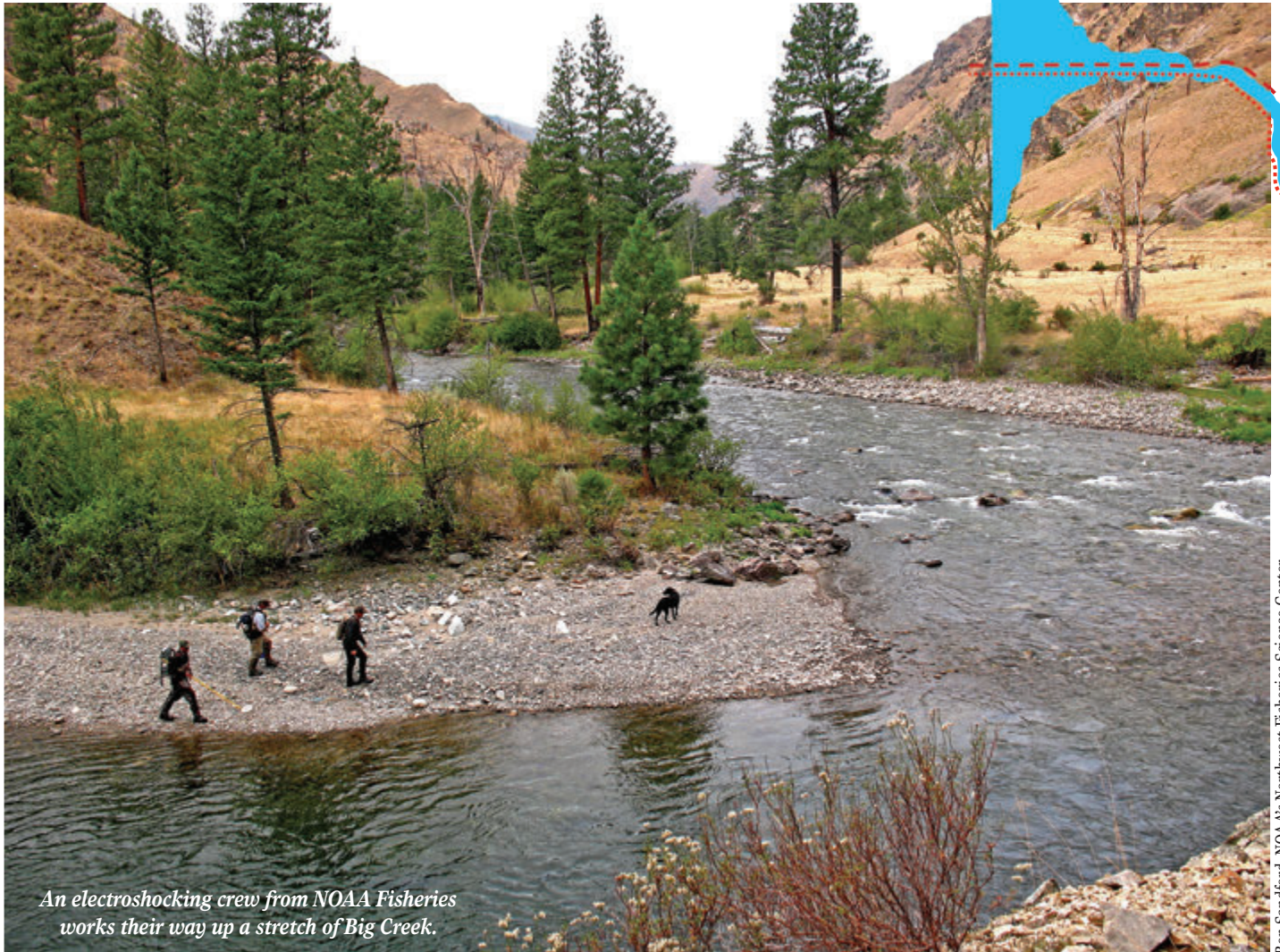


68

Wild Spring Chinook

Where Are They Going and How Do We Know?

Matthew Nesbit



An electroshocking crew from NOAA Fisheries works their way up a stretch of Big Creek.

Ben Sandford, NOAA's Northwest Fisheries Science Center

Recently you were spending all of your free time pounding the waters of the Columbia River trying to catch one of the most sought-after game fish in the land, were you not? Over the countless hours you spent fishing alongside several hundred of your fellow spring chinook fanatics hopefully you managed to put a handful of these tasty beauties in the boat or on the bank. But what happened to the ones that you didn't keep? The natives, the wild fish, the high-finners.

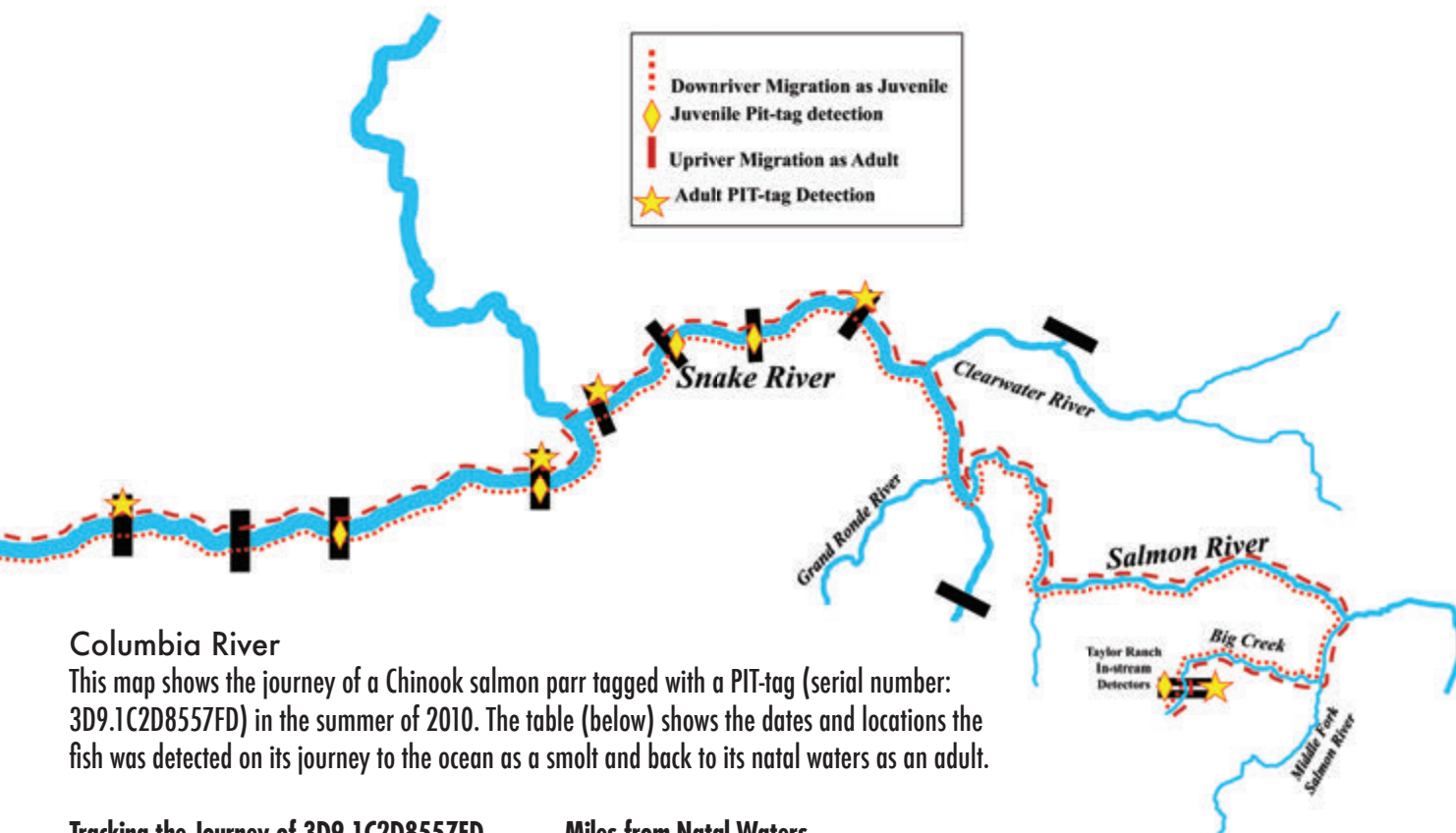
As an avid fisherman, I can wholeheartedly understand the disappointment that pangs in your heart as you watch the

tastiest meal imaginable swim away after being fairly apprehended. All this after tumbling out of bed long before the sun rises, fumbling in the dark to ready your gear and have your baits perfectly positioned as the crisp night air slowly gives way to the early summer heat. I too have been guilty of cussing a native fish. We are out there to catch and keep one of the strongest, most beautiful and best-eating fish in the world. Not many people release hatchery springers.

You know the fish that I'm talking about. It could have been the first and only taker on a day when they seemed to have

lockjaw, it could have been the one that you battled late in the day after waiting hours for a bite, or better yet it could have been just another fish in the middle of a banner day.

Regardless of the circumstances, if you were asked where that native springer is headed, what would you say? Upriver would be correct. Way upriver would be better. Idaho would be closer. But about 1,200 river miles up the Columbia River at 5,000 to 6,000 feet above sea level in a tiny tributary of the Salmon River system might be spot on. For example, that native that you landed and gently released could be



Columbia River

This map shows the journey of a Chinook salmon parr tagged with a PIT-tag (serial number: 3D9.1C2D8557FD) in the summer of 2010. The table (below) shows the dates and locations the fish was detected on its journey to the ocean as a smolt and back to its natal waters as an adult.

Tracking the Journey of 3D9.1C2D8557FD

SITE OUTMIGRATING AS A JUVENILE

TAY	Taylor Ranch In stream Monitor (Big Creek)
GOJ	Little Goose Dam Juvenile Bypass System
LMJ	Lower Monumental Dam Juvenile Bypass System
MCJ	McNary Dam Juvenile Bypass System
JDJ	John Day Dam Juvenile Bypass System

Miles from Natal Waters

DATE
Sept-02-2010 0
April-18-2011 406
April-20-2011 448
April-23-2011 508
April-28-2011 585

SITE RETURNING AS AN ADULT

BO1	Bonneville Dam Fish Ladder
MC1	McNary Dam Fish Ladder
IHR	Ice Harbor Dam Fish Ladder
GRA	Lower Granite Dam Fish Ladder
TAY	Taylor Ranch In stream Monitor (Big Creek)

Miles from Ocean

DATE
July-06-2012 146
July-11-2012 292
July-12-2012 334
July-16-2012 431
August-26-2012 800



destined to spawn in Elk Creek, a tributary of Bear Valley Creek, a tributary of the Middle Fork of the Salmon River, a tributary of the Salmon River, a tributary of the Snake River, a tributary of the Columbia River.

Dependent on their home tributaries, these wild spring and summer chinook populations of Idaho are listed under the Endangered Species Act as either threatened or endangered. What is being done to monitor and help these wild fish? How are we "saving the salmon"?

Over the past seven years, I have been lucky to be part of a NOAA Fisheries

project aimed at monitoring the population dynamics, migratory behavior and parr-to-smolt survival of many wild chinook salmon populations throughout the Salmon River basin of central Idaho. With proper fishery management, good ocean conditions and quality habitat available for spawning salmon, naturally produced wild salmon could very well become a major contributor to the Columbia River runs.

Throughout the drainages of the Salmon River there exists a vast network of tiny tributary streams that support populations of truly wild adult spring and summer chinook salmon. From late July to early

September, biologists from NOAA's Northwest Fisheries Science Center (NWFSC) work the tributaries of the Salmon River. While individual populations are relatively small, these streams hold populations of native spring/summer chinook large enough to be studied within the scope of research for the entire Columbia River system.

The adult spring and summer chinook of Idaho spawn July through September and most of their progeny hatch 170 to 270 days later, depending on water temperatures. They first emerge from the pea-sized spawning gravel in spring, feed heavily



Wild spring chinook parr range from 55-80 mm.

Todd N Pearsons image

during spring, summer, and fall and once again either retreat to overwinter in the gravel of these tiny high-mountain streams or migrate downstream to spend winter in the bigger water of the Salmon River.

As the following spring approaches, day-length and water temperatures increase and young salmon commence their migration down the vast Salmon, Snake, and Columbia river systems. This behavior of spending a winter in rivers or natal streams after hatching is why these spring/summer chinook salmon smolts are known as yearlings or “stream-type” fish.

We work with freshly hatched salmon, or *parr*, spawned by the previous years’ adults that returned to their natal stream. Salmonid parr are named for the vertical bars on their sides called parr marks. These tiny fish lose their marks and become silvery/chrome when they leave their natal streams and begin their migration downriver to the ocean as smolts. As parr metamorphose into smolts, their bodies acclimate to survive in saltwater rather than freshwater. Using spawning survey data provided by Idaho Fish and Game, we are able to gauge the numbers of fish that we need to tag from each tributary in order to best represent that specific population. The small percentage of wild chinook parr that are tagged in Idaho by NOAA Fisheries serve as flagship groups (or groups meant to represent the population as a whole) for the entire population of juvenile wild-salmon migrating out of those small tributaries.

A 12mm passive integrated transponder or PIT tag.



NOAA's Northwest Fisheries Science Center

Wild chinook salmon parr ranging in size from 55 to 80mm are tagged using a passive integrated transponder or PIT tag. These tiny tags are about the size of a grain of rice and will remain inside the fish throughout its life. When these tiny tags, embedded in the body cavity of the smolts, pass over or through any of the hundreds of PIT tag readers located throughout the Columbia, Snake, and Salmon river systems, the tag sends a unique code (e.g. 3D9.1C2D8557FD) that identifies that



A wild spring chinook being tagged.

Ben Sandford, NOAA's Northwest Fisheries Science Center

individual fish and the date and time it was detected. This data is then linked to information gathered when the fish was first tagged including, where it was tagged, by whom, on what day, length and weight when tagged, tagging agency, etc.

These detections and tagging data are stored on a central database maintained by the Pacific States Marine Fisheries Commission and accessible to the public (WWW.PTAGIS.ORG). From this site, researchers monitor juvenile outmigration timing and survival and subsequent adult return timing and survival. NOAA Fisheries also installs PIT tag antenna arrays in some of the small Idaho tributaries where these parr are tagged. There are also PIT tag detectors installed on almost every dam in the Columbia Basin as a component of the juvenile fish bypass systems. These bypass systems are used to divert fish away from turbine units. Currently there is work underway to develop a PIT tag antenna system which will allow tags to be detected as they pass over spillways; the preferred route of passage for juvenile fish passing dams. Fish can also be detected in the estuary by a NWFSC project that trawls an array of nets and a PIT tag antenna used to quantify and monitor the salmonid species composition, size and run timings throughout the entire Columbia system. All of these innovations help to measure the effectiveness of efforts to bolster wild chinook salmon populations.

In recent years, a big part of the Columbia River's salmon research has focused on smolt survival throughout the basin both in river and in the ocean, as well as smolt-to-adult return rates. Many people involved in fisheries, both fishermen and researchers, have recently added the term "ocean conditions" to their vocabulary. It is undeniable

that ocean conditions impact the survival of juvenile salmon and affect smolt-to-adult

survival rates. However, simply stated, the more smolts that survive to the ocean the better the chance for larger adult-fish returns.

Where do the wild spring chinook salmon of Idaho fit into all of this? To be perfectly honest, they are just one piece of the puzzle. However, they are what you might refer to as one of the original pieces.

The magnitude and diversity of the Columbia River Basin lends itself to almost limitless research questions. This story of the wild salmon of central Idaho is just one example of the many research projects conducted each year to manage and improve our future fisheries on the Columbia.



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